QUIVIRA NARRATIVE REPORTS SEPTEMBER - DECEMBER 1956

BRANCH OF WILDLIFE REFUGES NARRATIVE REPORTS

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REFUGE QUIVIRA PERIOD SEPT-DEC 1956

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QUIVIRA NATIONAL WILDLIFE REFUGE

STAFFORD, KANSAS

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Clerk-Typist	Vacant

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MARRATIVE REPORT
QUIVIRA NATIONAL WILDLIFE REFUGE
STAFFORD, KANSAS

(First Report)
To December 31, 1956

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NARRATIVE REPORT
QUIVIRA NATIONAL WILDLIFE REFUGE
STAFFORD, KANSAS

To December 31, 1956
(First Report)

INTRODUCTION

This embryo refuge, still in the acquisition stage, is located mainly in northeast Stafford County with one section in Rice County, Kansas. The counties are near south central Kansas, and the proximal major cities are Hutchinson, located approximately 30 miles directly east of the SE corner of the refuge; and Great Bend, located approximately 25 miles northwest of the northwest corner of the refuge. Stafford, a town of around 2,000 people and located 12 miles southwest of the SW corner, is the site of temporary headquarters. The total area planned for acquisition is 21,513 acres; roughly 4,000 acres are under title or option.

The refuge comprises a typically saline alkali sump area and is located in an expanse of flat country described by physiographers as the Plains Border. The area is transitional between the Great Plains Province and the Central Lowland Province and its biota is affected by each.

The most important topographical feature is Rattlesnake Creek, which heads about 80 miles southeast of the refuge and provides the main source of water. Part of the flow is presently caught in natural and man made impoundments, and eventually the surplus empties into the Arkansas River not far to the northeast.

The elevations vary less than 20' from an approximate average elevation of 1811'. The generally flat terrain is occasionally interupted with low sandhills formed by wind blown sand, and soils range from sand to heavy clay. With such gentle gradient there is little water erosion, though runoff flooding is sometimes extensive. Runoff and constancy of flow are affected by the growth of agricultural activities begun about 1870 when this part of Kansas was first settled.

The climate is generally mild, but extremes are not uncommon. Principal crops are winter wheat, sorghum grains and alfalfa. Native grass is abundant on the refuge, and grazing and haying are of considerable economic importance. The farmland of the refuge is of poor to fair quality with much of it vulnerable to erosion by wind.

The primary purpose of the refuge is to alleviate pressure on wintering areas of the Central Flyway with special attention to geese. Main objectives of development aim at the efficient management of available water and the improvement of upland food production.

This should be accomplished through the development of comparatively small im poundments and waterways. Means for storage, or bypass, of runoff should be provided, and attention to the extension of shoreline would be prominent. Uplands would be benefitted most by the appropriate development and management of croplands and rangelands. Related economic uses are planned with attention to wildlife values upermost.

HISTORICAL

Establishment of the refuge was approved by the Director on August 12, 1953. On May 3, 1955 the Migratory Bird Conservation Commission approved the establishment of the refuge and authorized the processing of purchase agreements.

Since Columbus' discovery of America, gold and legends of gold proved an irresistible magnet to lure adventurers from the mother countries. The Spaniards' insatiable hunger for gold was directed toward two rainbows, one south to the Inca country and the other north toward the so called Seven Golden Cities of Cibola. Pizzaro found the wealth of the Incas, and while Cortez was interested in making the northern venture, he fell out of favor with the viceroy of New Spain (Mexico) and was displaced by Coronado.

The Indians had reported Cibola as being rich, as indeed it was, but not in gold. In 1539, an exploratory visit by Friar Marcos and a small party was repulsed when Marcos' emmissary, a lustful negro, incurred the enmity of the Indians. This party did not accomplish their purpose of determining the amount of treasure, but rumors of gold gained momentum nevertheless, and a gold fever ensued.

On Feb. 23, 1540, the expedition led by Coronado and consisting of around 1,000 well equipped men, began the journey to Cibola from Compostela, New Spain. Their purposes were to acquire gold, plant the flag of Spain and erect a cross to St. Peter.

First of the Seven Cities of Cibola (now Granada N. M.) was occupied by force July 7, 1540. With the disappointment of not finding gold there Coronado was a willing believer in the fabrication promising riches to be found at the distant kingdom of Quivira.

On April 23, 1541, led by a scheming guide, the expedition set out across the Plains for Quivira. Note was made of the vast herds of buffalo, many wolves, antelope, waterfowl, rabbits and the super-abundance of grass.

After being led away from their destination in hazardous wandering part of the group was ordered back to the base, while Coronado, with a picked group and guided by a homesick Quivira Indian, continued toward Quivira. Following a route along the Arkansas River they reached their first Quivira Indians hunting buffalo July 2, 1541. The Indians were terrified at their first sight of horses and white men, but reassured by the native guide, they became friendly. No gold was found, and while Coronado was impressed with the physique and industry of the Indians and the fertility of the land, his expedition returned to New Spain disheartened and bearing little resemblance to the pompous group which the year before had departed in a display of color and amid the blaring of trumpets.

The Quivirans were not warriors but cultivators of the soil and hunters. Many of the men were over seven feet tall, and the women were well proportioned. The men wore their hair long and dressed it with oil rendered from sunflower seeds, Usually bound, the hair was sometimes released when it would "drag on the ground". The hair of the women was bobbed. Both men and women adorned themselves with bright paint and ornaments.

Dogs were the sole beasts of burden. The Quivirans domesticated no animals, though buffalo calves would have been easy to capture, and turkey and prairie chicken were abundant.

Habitations were round grass huts about 30 feet in diameter, with vents in the top. Each family had a skin tepee held in reserve for hunting trips. The people were hospitable and charitable, and meat, with bean or corn flour thickening, was kept simmering in a pot for whomever might visit. When dog meat was served, the host was giving the utmost in hospitality.

Agricultural products were corn, beans, melons, gourds, pumpkins and squash. Growing wild were plums, grapes, mulberries, elderberries, etc. The main meat was buffalo supplemented with dog, antelope, rabbit, terrapin, turkey, prairie chicken, quail, dove and waterfowl. Fish were taboo as was buffalo milk. The many foods were prepared in various ways for storage for later use. So useful were the many parts of the buffalo that it was termed the Indians' department store.

Tools and weapons made of various flints, bone and sandstone implements, pipes and ornaments all were of fine workmanship. There is evidence of some commerce in the items, though no metal or glass trinkets were found to indicate the influence of the white man.

Bows and arrows were well made, and the better bows were made from the "bois d' arc" trees and backed with laminated bone. When visited by Coronado the Indians were using bows five feet long. Later, when using horses they used a shorter bow. Some Quivirans were reputed to be able to run a buffalo down or shoot one through. They were so accurate they were able to kill rabbits on the run and waterfowl on the fly.

What actually became of the Quivirans is not known, but it appears that through association with other tribes they lost their identity as a distinct people. At any rate, less than 100 years later they had become scattered, and their country was never again inhabited by Indians who built houses and tilled the soil. From the time of the departure of the Quivirans to settlement by whites the area was used by various Indians, traders, trappers, wanderers and soldiers. Spain claimed the land in 1541 and again in 1601. England's colonial policies reached out to include the land in 1607, while France claimed title through exploration in 1673-82. The United States purchased France's claim in 1803, and Mexico ceded the Spanish claim in 1848.

First settlers were ranchers whose holdings were fabulous. Cattle of the Double-Heart Ranch, founded in 1867, watered at Rattlesnake Creek and roamed the present refuge area. There were no Indian troubles after the treaty of 1867 at Medicine Lodge, and the Chisholm Trail, begun in 1867, was near enough to affect local operations.

Sunshine City, later named Stafford and presently the location of temporary refuge headquarters, was founded about 1876 when the first crude (partly sod) hotel was built. Buffalo, antelope, deer, prairie chicken, waterfowl and rabbits were still abundant, though the buffalo avoided ranches stocked with cattle.

As the country attracted increasing numbers of settlers the ranches became smaller, and by 1887 the great cattle drives gradually gave way to an orderly combination of beef production and crop farming.

It is fitting that the Quivira National Wildlife Refuge should be named after the Indians whose association with the area was the first of record and whose stature in the primitive world was particularly admirable.

(To be continued in subsequent issues)

I. GENERAL

A. Weather Conditions:

Month	Precip.	Cumul. Ave.	Max Temp	Min. Temp	Cumul. Ave
Jan	1.08	.68	71	-4	32
Feb	.38	.91	72	-5	37
Mar	..19	1.21	86	8	45
Apr	1.87	2.39	91	28	56
May	3.40	3.90	99	45	65
Jun	.57	3.80	107	48	75
Jul	2.48	3.03	104	60	81
Aug	.62	2.90	107	49	80
Sep	--	1.81	103	40	72
Oct	3.74	1.33	93	35	60
Nov	.26	.86	78	14	45
Dec	.08	.81	70	8	35
Total	14.67	24.	Cum. ave T. 57°	Wind ave. 12.8 mph	

The area lies in the path of alternate masses of warm moist air moving northward from the Gulf of Mexico and currents of cold dry air from the polar regions. Consequently, weather is subject to frequent and often abrupt changes, though such changes are usually of short duration. Summer months are usually warm and occasionally the term "hot" is a better description. Winters are usually mild. The absolute temperature range is quite great, while the day-night range is moderate.

Annual precipitation is the determining factor in annual crop production. As noted, the normal annual precipitation is about 24 inches, distributed with heaviest fall in the spring and summer months and the least monthly from late fall through the winter months. The highest rainfall on record was 1948 with 34.56 inches. The reporting year with 14.67 inches was very near the record low.

As noted, wind movement averages 12.8 mph, and tornados are not uncommon in the vicinity. The prevailing wind direction is south, though occasionally strong northerly winds accompany the advent of severe cold fronts. Occasionally and during a summertime heat wave, strong and hot southerly winds do considerable damage to growing crops in a few hours duration.

Thunderstorms occur on an average of 51 days per year with the greatest frequency during the heaviest precipitation period, spring and summer. Hail accompanying thunderstorms is not uncommon though heavy hail damage is infrequent.

On an average, temperatures of 90 degrees or above occur on 52 days per year, while there are only 2 days a year when zero degrees or lower is recorded.

Fewer than $\frac{1}{4}$ of the days are cloudy, and the average date of the last killing frost is April 18; average first killing frost, Oct. 18; average length of the growing season is around 184 days.

In summation, planning should include attention to the fact that abrupt changes of weather are common, and extremes of temperatures, precipitation and wind are normal. Physical structures as well as crops could be affected. Though the past few years have been extremely dry, this part of Kansas boasts generally mild winters, bounteous rainfall and high farm crop production. Though the summers are hot and the winds high there are few days when outside work need be interupted due to the weather.

(Kansas is Indian and relates to wind)

B. Water Conditions:

As noted, an extended period of drought continued during the period. Affected were lowering water tables, drying lakes and dead streams. All lakes, ponds and streams on the proposed refuge area dried during the period.

Rattlesnake Creek, the principal source of water for the refuge ceased flowing into the area on July 18 and resumed flowing with a trickle on November 29. At the close of the period the creek was flowing around 4 cfs.,and the Little Salt Marsh was gaining slowly with the bottoms nearly covered. The Little Salt Marsh was only partially filled at the beginning of the period and was dry by September. The Big Salt Marsh, traversable by car during the summer, gained a bit during October. However, most of the water, and hunting, in the area was produced through the use of pumps operated expressly for the purpose. Some of the water was reasonably palatable, while much of it was extremely salty. Though most of the water of the area is unfit for culinary purposes most of it is satisfactory for use by wildlife, and a few sources of excellent quality water exist near the refuge. It is probable that it would be possible to follow such sources to the refuge where they could be developed to advantage.

The scarcity of water has been noted, but super-abundance sometimes presents difficulties, and in the planning, provision must be made for the management of flood waters. It has been proposed that excess waters be stored to the extent possible for use during seasons of short supply. Normally, Rattleshake Creek would supply the needs adequately, but seasons resembling the immediate past season could have benefitted through the use of storage water. Provision should be made for the by-passing of flood waters in excess of management capabilities. Such by-passing would not only reduce sedimentation in the pools but would reduce the hazard to structures as well. The appearance of the streambed suggests that historically, with sufficient ground cover upstream, the runoff was moderate. With prevailing gentle gradients of the area, erosion by water need not be excessive.

Principal bodies of water include the Little Salt Marsh, the Big Salt Marsh, the Darrynane Marsh and numerous s maller ponds, channels and pools. Future development would include additional channels and impoundments and the refinement of the present system. Planning and construction must of course depend on future surveys.

In connection with the water management of the refuge the question most often asked is "Where do you plan to get sufficient water?". In view of the past dry season the question is particularly appropriate. The question can best be answered by noting that this was a record year and could not be expected to occur more than once in many years. Supplemental sources should be considered, and strategically located windmills would have value in most seasons. At any rate, appraisal of the availability of ground water as emergency supply for ponds and irrigation should be continued.

Water for irrigation might be gained from upstream impoundments; however, most of the terrain is too uneven to permit surface flooding. Most irrigation needs would have to be met with the use of pumped water, either for flooding or sprinkling. The necessity and feasibility of irrigation warrants serious consideration.

C. Fires:

No fires occurred during the period. With the maze of channels, ponds, roads and fields the hazard is not considered to be great. However, future planning should include the construction of additional fire-breaks, trails and equipment.

WILDLIFE

A. Migratory Birds:

1. Populations and Behavior.

Since except for pumped water the area was almost entirely devoid of water, the waterfowl population was negligible. There was little hunting activity, confined mainly to small puddles, but the percentage of hunter success was high. With both hunters and waterfowl concentrated on the very limited water surface area no birds were permitted to remain long. Therefore, the population was transient and not great at any time.

A few ducks and geese were noted in September, there was a continuous minor migration, and only a few stragglers remained at the close of the period. Thin ice covered much of the water by mid-December, and since the hunting season continued to Dec. 20, there was little reason for the birds to remain.

Species observed included those common to the flyway, and the bags contained the expected interesting variety. The similarity of species and pattern to the Salt Plains population was marked.

Mourning Doves were numerous at the peak of migration which occurred early in September. Few doves remained at the close of the period. It is gratifying that the Upland Plover is quite common on the refuge.

2. Food and Cover:

With the lack of water even the existence of an abundance of maize and young wheat did not attract a great population. For the birds present the food and cover were adequate, though for a normal population the food and cover would not have met requirements. However, had the population been normal it would have been so because of better weather conditions which in turn would have produced more food and cover. Sorghums (mainly maize), small grains (mainly wheat) and alfalfa are crops most commonly grown in the area. The relationship of populations to protection, food and water was again demonstrated.

3. Botulism:

None observed. When the population should include many nesters particular note should be made of the possibility of the incidence of botulism. Presumably, all the factors attending botulism are present

in the marsh areas. With limited summering populations the presence of toxin has heretofore not been apparent. Though sickness should occur it is probable that water would be manageable to the extent that high losses could be avoided.

4. Lead Poisoning and Other Diseases:

With a low population no victims of lead poisoning were noted. However, since the area has been hunted heavily it is probable that the ingestion of pellets would be common. With future development including new areas and water management it is not probable that lead poisoning would be extensive.

B. Upland Game Birds.

1. Population and Behavior:

Pheasants are particularly numerous, while Bobwhite Quail are common. Little competition affects the birds, and food and cover are abundant, though conditions would be improved through future plantings and particularly by the removal of livestock from such habitat as shelterbelts and isolated spots popular with the birds. Great benefits would result from improved management of the marshes and rangeland.

Movement between the refuge area and adjacent lands is presently not extensive, but improved conditions inside could be expected to encourage movement to reduce population pressure. Assuming the refuge population would soon build impressively top consideration should be given to the feasibility of a public hunting program.

2. Food and Cover:

Partially discussed above, food and cover in the general area are abundant but could be improved through proper management of shelterbelts, farmlands, marshland and rangeland. Local farm crops are favored by the birds, and improved cover would be inevitable with more favorable weather and enlightened practices.

3. Disease:

No evidence of disease was noted.

C. Big Game Animals.

An occasional stray deer is the limit of the big game population on the refuge.

D. Fur Animals, Predators, Rodents, and other Mammals.

The proposed area has an animal population normal to the locality. Fur bearers include mainly mink and muskrats which were not much in evidence during the past season. Coyotes, badger, 'coons, 'possums, cotton-tails, jackrabbits, and small rodents comprise the bulk of the population. At the close of the period no control measures appear necessary, though the coyote hunters find it incredible that they should not be permitted to have free run of the area for the pursuit of their sport. As usual, they see an overabundance of coyotes, but do not think assistance from the Branch of PARC would be appropriate.

It is yet too early to make recommendations relative to management of the fur resources of the refuge; however, it is apparent that such a program would soon have to be considered.

E. Predaceous Birds.

The list of predaceous birds includes the hawks common to the locality, owls (particularly Great horned), eagles, blackbirds, grackles and crows. The line between predation, opportunity, need, etc. is a difficult one to define; however, each is predaceous in its own way. With the possible exception of crows the population is not sufficiently great to constitute a menace or to warrant control. The crows are super-numerous during the winter, and it is conceivable that they could exert an adverse effect on refuge crops as they do on the crops of adjacent farmers. Since the crows and waterfowl are not abundant during the nesting season it would be difficult to foresee a measurable influence in that connection.

F. Fish.

As noted in the discussion of water conditions all water areas of the refuge were dry. Puddles which remained soon became untenable for fish, and practically all fish of the area perished (note pics). One of the most sought after fishing spots of the county, the Little Salt Marsh, dried completely. Dead fish revealed a condition of a super-abundance of very small carp and a few larger carp, bullheads and channel catfish. Quite probably, ridding the marsh of the fish should have the effect of benefitting future fishing. Upstream sources of re-infestation exist; however, the new start given the game fish should promote a few years good fishing.

Fishing is a very popular local sport, and care to prevent its intruding upon primary purposes must be exercised. Development of the refuge would result in improved conditions for fish.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development:

With limited funds and personnel activity under the heading was confined mainly to boundary posting, cleanup and setting up office. Effort was directed toward the formulation of plans for operation and development. Since lands acquired thus far form an incomplete pattern the development of refuge lands, with consequent benefit to adjacent land planned for acquisition, would make purchase more difficult.

B. Plantings:

Activity under the heading included the spring planting of approximately 100 acres to sweet clover and 15 acres to alfalfa and lovegrass for cover. These plantings were devoured by grasshoppers. To retain wheat allotments a total of 130 acres were under permit to two cash rent operators. Adverse conditions notwithstanding, at least part of the wheat is doing well, and ground cover is considered to be adequate.

C. Collections:

No collections were made on the area. Seed used was purchased from local sources.

D. Receipts of Seed and Nursery Stock:

As noted, seed used was purchased locally.

IV. ECONOMIC USE OF THE REFUGE

A. Grazing:

Lands acquired and proposed for acquisition include lands much in favor with graziers and have a considerable impact on local economy. Under improvement and restriction there is little reason why grazing should not be continued. Much interest centers on refuge policy concerning such use, and advantage is taken of every oppourtunity to explain the Service program in this connection. Graziers are prepared for reduced stocking rates, complete deferrement in some instances, and other departures from usual local practices. Generally, the reaction is favorable.

The terrain is generally flat but interspersed with low sand hills. Two types range are thus recognized, and plans are made accordingly. The low-lying flats have a predominance of saltgrass (Distichilis stricta),

buffalograss (Buchloe dactyloides), switchgrass (Panicum virgatum), dropseed (Sprobolis cryptandrus), alkali sacaton (Sprobolis airoides) and others of less importance. Such types support heavy grazing and are difficult to abuse. Reduced use is planned for the coming season.

The uplands, being sandy, more hilly and lacking moisture are in sad shape, and effort toward restoration must be more drastic. In a purposeful effort to avoid undue hardship to present owners or tenants they should be encouraged to reduce herds voluntarily, and they should be assured the retention of "rights" our priority system allows.

Common upland grasses include the bluestems (Andropogon sp.)(mainly furcatus), switchgrass (P. virgatum), gramma (Bouteloua gracilis), some saltgrass (D. stricta), and annual weeds and grasses. An extensive program of overseeding is planned, and for the benefit of new plantings irrigation should be considered.

At the close of the period approximately 1407 acres, comprising 15 units, grazing land were under title or agreement. Additions to the acreage would be continuous.

Constrary to expectations, some graziers object to lower stocking rates on the basis that the rank growth produces a poison which is fatal to livestock; that the rank growth preserves the dead grass remnants which are unpalatable to livestock; that too long grass harbors many insect pests. There is a hint of foundation in each objection, but there is also benefit to grazing as well as to wildlife through reduced grazing pressure.

The sole grazing permit allowed 102 AUM's at $2.00, amounting to a total fee of $204.00

A. Haying:

The economic use of native grass for hay is popular with the local graziers and should be permitted to a limited extent. Some of the fields presently under haying programs could best be converted to grazing with ultimate benefit to wildlife. Individual units should not be subjected to both haying and grazing during a single season.

Local operators commonly purchase hay by the acre, and some explanation is necessary to acquaint them with the Service method of selling the hay standing on a tonnage basis. Also, contrary to local practice, feed lots should be discouraged.

Some of the lands acquired have some fair to good stands of alfalfa. These fields should be continued in production and the hay sold according to regulation. The planting of new fields should be encouraged.

Fees vary with the type of hay and the season. The 1956 season rate of $6.50 per ton standing for alfalfa hay and $5.00 for prairie hay appeared to be in line, and a smililar fee, subject to the Regional Director's authority to adjust prices 50%, is recommended for the immediate future.

The time and manner of cutting should be such as to avoid disturbance to the purposes of the refuge and should be directed by the Refuge Manager. Occasional islands of vegetation should be left for wildlife use.

To date a total of 4 permits were issued for the harvesting of 13.11 tons alfalfa hay for a return to the Government of $85.22.

C. Fur Harvest:

Prior to the extended drought muskrats and mink were common on the marshes. With development of the waterways of the refuge and improved weather conditions it is probable that a trapping program would again be appropriate. However, no trapping should be planned until the population again should reach harvestable numbers, or when there should be trouble spots which might endanger structures or affect proper distribution.

When trapping begins, units and controls should be set up and the program developed along approved lines. The first trappers would probably be members of the refuge staff. Later, following the established pattern of priority, outside trappers would be invited to participate on the usual basis.

Not generally considered important furbearers are various other animals common to the area (see list). The most prominent is the coyote which provides popular sport for local hunters. A public predator hunting program is not recommended at this time, though surpluses should be controlled through the Service Branch of PARC.

D. Timber Removal:

A few good stands of cottonwood and lesser abundance of willows and locust, mulberry and elm comprise the ~~the~~ timber resources of the area. Any justification for a timber removal program is not foreseeable at this time, except that a few locust fence posts might be removed by refuge personnel for use in refuge fences. Timber removal incidental to development would of course be permissible.

E. Other Uses:

It is difficult to foresee other uses; however, it is possible that in connection with public use of the area there may be requests for concessions.

V. FIELD INVESTIGATION OF APPLIED RESEARCH

A. Progress Report:

No formal project has been assigned; however, most of the work thus far has been related to the accumulation of data as applied to management and development of the refuge. Included has been information conerning such programs as grazing, farming, haying, etc., and misc. data related to weather, wildlife, water, physiography, history, etc. were given considerable attention.

Observations were made of local practices, and technical data were gained from oil companies, various agencies and individuals. This office is on the regular mailing list of the U. S. Weather Bureau, Kansas Forestry, Fish and Game Dept. and others.

On the bases of data gained an Interim Economic Use Plan has been prepared.

Following are preliminary refuge bird and mammal lists:

REFUGE BIRD LIST (preliminary)

Pied-billed Grebe
White Pelican
Double-crested Cormorant
Great Blue Heron
Common Egret
Snowy Egret
Green Heron
Black-crowned Night Heron
Yellow-crowned Night Heron
American Bittern
Canada Goose
White-fronted Goose
Snow Goose
Blue Goose
Mallard
Gadwall
Pintail
Green-winged Teal
Blue-winged Teal
American Widgeon
Shoveler
Wood Duck
Redhead
Ring-necked Duck
Canvasback
Lesser Scaup
Common Goldeneye
Bufflehead
Ruddy Duck
Common Merganser
Turkey Vulture
Mississippi Kite
Sharp-shinned Hawk
Cooper's Hawk
Red-tailed Hawk
Harlan's Hawk
Swainson's Hawk
Rough-legged Hawk
Golden Eagle
Bald Eagle
Marsh Hawk
Osprey
Peregrine Falcon
Sparrow Hawk
Bobwhite
Ring-necked Pheasant
Sandhill Crane
King Rail
Sora
American Coot
Piping Plover
Snowy Plover
Killdeer
American Golden Plover

Continued

Black-bellied Plover
Common Snipe
Long-billed Curlew
Upland Plover
Spotted Sandpiper
Solitary Sandpiper
Willet
Greater Yellowlegs
Lesser Yellowlegs
Pectoral Sandpiper
White-rumped Sandpiper
Baird's Sandpiper
Least Sandpiper
Dowitcher
Stilt Sandpiper
Semipalmated Sandpiper
Western Sandpiper
Marbled Godwit
Sanderling
American Avocet
Black-necked Stilt
Wilson's Phalarope
Ring-billed Gull
Franklin's Gull
Forster's Tern
Common Tern (?)
Least Tern
Black Tern
Mourning Dove
Yellow-billed Cuckoo
Roadrunner
Horned Owl
Burrowing Owl
Short-eared Owl
Chuck-will's-Widow
Common Nighthawk
Chimney Swift
Belted Kingfisher
Yellow-shafted Flicker
Red-shafted Flicker
Red-bellied Woodpecker
Red-headed Woodpecker
Hairy Woodpecker
Downy Woodpecker
Eastern Kingbird
Western Kingbird
Scissor-tailed Flycatcher
Horned Lark
Tree Swallow
Bank Swallow
Rough-winged Swallow
Barn Swallow
Cliff Swallow
Blue Jay
Common Crow
Carolina Chickadee
House Wren
Bewick's Wren
Sedge Wren
Mockingbird
Catbird
Brown Thrasher
Robin
Common Bluebird
Mountain Bluebird
Loggerhead Shrike
Starling
Red-eyed Vireo
Warbling Vireo
Yellow Warbler
Myrtle Warbler
Audubon's Warbler
Yellow-throat
House Sparrow
Bobolink
Common Meadowlark
Western Meadowlark
Yellow-headed Blackbird
Redwing
Orchard Oriole
Baltimore Oriole
Brewer's Blackbird
Purple Grackle
Common Cowbird
Cardinal
Blue Grosbeak
Dickcissel
American Goldfinch
Eastern Towhee
Grasshopper Sparrow
Vesper Sparrow
Lark Sparrow
Slate-colored Junco
Tree Sparrow
Harris's Sparrow
White-crowned Sparrow
Song Sparrow
Chestnut-collared Longspur

REFUGE MAMMAL LIST (preliminary)

Opossum
Mole
Short-tailed Shrew
Least Shrew
Red Bat
Black Tailed Jackrabbit
Cottontail Rabbit
Eastern Fox Squirrel
Black-tailed Prairie Dog
Pocket Gopher
Kangaroo Rat
Cotton Rat
Southern Lemming Mouse
Muskrat
Grasshopper mouse
Plains Harvest Mouse
Western Harvest Mouse
Deer Mouse (P. man. neb.)
Deer Mouse (P. leu. nov.)
House mouse
Raccoon
Mink
Spotted skunk
Striped Skunk
Badger
Coyote
Whitetail Deer

*****

VI. PUBLIC RELATIONS

A. Recreational Uses:

Since no provision is made for the recreational use of lands acquired this early in the program no public use is shown. Interest in future recreational possibilities is high, and the local people look forward to fishing and swimming, particularly in the Little Salt Marsh. There is also interest in boating, but the probability of such use is minimized.

Discussions with people reveal that the proposed public access and use of the area is an important selling point. Committments on public hunting command the interest of hunters, and others who do not hunt generally accept the idea as being generous and see it as a contribution to the community. There is considerable resentment toward clubs of the area who forbid use of their properties by local people.

Coyote hunting promises to be the presently popular sport most difficult to curtail; however, the static is not expected to become overwhelming.

In summation, present recreational use is limited to club members and coyote hunters, and a well planned public use program would gain favor for the Service without interfering with primary purposes.

B. Refuge Visitors:

As noted above, public use of the lands under title was not yet permitted. However, if the names of casual callers at the office were listed the lot would be impressive. The visitors consume much time, but at this stage of the game it is considered important that

The more people contacted, the more the public would become properly acquainted with the Service and the Quivira Refuge. The usual misapprehensions and misinformation attending new projects is corrected most effectively through this avenue.

OFFICIAL VISITORS

Date	Name	Affiliation	Purpose
Aug. 27	R. St. John	FWS Reg. II appraiser	Land acquis'n
Sep.11-14	T. E. Conrardy	Supvr Lands Reg. II	" "
Sep.19-23	E. Moulton		
	M. Miller	Reg. II Br. Engr.	Surveys
Sep.13	K. Teichman	Chamber of Commerce	Signs
Sep.14	E. Tucker	" "	Publicity
Sep.18	M. E. Ramsey	GMA	Courtesy
Sep.19	R. Watson	USDA - REA	Rural Tel. info.
Sep.14	D. L. Merten	Gr. Bend Tribune	Information
Oct.1	B. Stafford	Kansas Corp. Comm.	"
Oct.9	M. Ramsey	GMA	Patrol and courtesy
Oct.9	B. Stafford	Kansas Corp. Comm.	Information
Oct.11-18	J. E. Walton	Reg. II Br. Lands	Land acquis'n
Oct.14	Da ve Leahy	Dir. Ks. For. Fish & G.	" "
	W. Moore	Ref.Mgr." "	Decoy flock
Nov.	T. Conrardy	Reg. II Supvr Br.Lands	Land acquis'n
Nov.16	M. Ramsey	GMA	courtesy
Nov.16	J. Mays	Game Protector KFF&G Dept.	Information
Nov.18	R. L. Means	Ref. Mgr. Kirwin WMgt.Ar.	Courtesy & materials
Nov.26	W. Moore	Ref. Mgr.KFF&G (Chey.Bot)	Goose flock & pen
Nov.29	M. Ramsey	GMA	Patrol & information
Dec.7	L. Means	Ref. Mgr. Kirwin	Supplies & infor.
Dec.10-11	G. E. Barclay	Reg. Ref. Supvr.	Inspection
Dec.27	M. Ramsey	Game Mgt. Agent	census & courtesy
Dec.28	Dick Eggan	Ks. FF&G Dept. biologist	Cheyenne Bot

C. Refuge Participation:

Each opportunity to promote goodwill for the project was accepted. In addition to day-to-day contacts numerous news items were published, and the refuge manager is a member of the Lions Club, Methodist Choir, and has been named a BSA counselor for boys working for conservation badges.

More formal participation included the following:

Date	Activity	Organization	Location
Mar. 22	slide talk	Kiwanis Club	Lyons
May 3	" "	Lions Club	Stafford
Jun.12	" "	Rotary Club	Stafford
Jul.30	" "	Rotary Club	Great Bend
Aug.1	" "	Kiwanis Club	Great Bend
Aug.15	" "	Farmer's Union	SW Stafford
Nov.18-5	" "	Cheyenne Bot. Club	Great Bend
Nov.26	" "	Farmer's Union	Putnam
Dec.3	" "	Farmer's Union	N. Stafford
Dec.13	" "	Baptist Fel. Club	N. Stafford
Dec.15	" "	local sports group	Stafford

D. Hunting:

No hunting was permitted on lands acquired except on those covered by reservations in purchase contracts. Those currently in extant will expire in 1958. Public hunting is planned for the refuge when acquisition is complete and when the population builds to the point of making such sue feasible.

Participation in adjacent hunting was limited, though individual hunter success was high. Almost all of the proposed area is controlled by private clubs. With the absence of surface water, the various operators rigged up large pumps to provide a minimum supply of water for the shooting set-ups. These attracted birds passing through, and with limited available water ar ea, some were taken. As noted, perhaps the main contribution of the refuge would be the closure of much of the area to hunting. This would provide rest and food for the birds and encourage them to remain longer, and hunting would benefit.

Due mainly to drought and the exclusion of the hunting public from private and club properties much of the former local enthusiasm for waterfowl hunting has cooled. It is expected that with the development of the refuge and the establishment of a public hunting program the interest would be revived. Many people are anxiously looking forward to the refuge program.

E. Fishing:

Fishing was practically non-existent during the period. Most of the ponds of the area dried early, and remaining waters became untenable for fish. Except for temporary loss of the sport it is probable that a new start would be beneficial. Observations of fish losses indicated an over-abundance of rough fish.

The Little Salt Marsh, the most sought after spot in the area, dried completely. Revealed was a super-abundance of small carp. The Service does not yet own this area, though it is planned for inclusion, and a public fishing program is recommended.

It would be a temptation to give favorable attention to the local tendency to delegate an inflated importance to fishing as opposed to waterfowl. The early and frequent stating of Service policies in this connection is important. Likewise, with boating constituting a nuisance to both fishing and waterfowl, this activity should be discouraged, or at least severely restricted.

In summation, fishing is a tremendously popular sport and should be permitted on a restr icted basis; however, the public must be made to consider waterfowl management as being the primary purpose of the refuge.

F. Violations:

Though minor infractions of the regulations are known to have occurred, no cases were made. Discussion in the field revealed that local people generally are cooperative and willing to abide by the rules and have a favorable attitude toward the project.

Coyote hunters thus far have been the most unreasonable group to deal with. They have long taken free rein in this and other localities. Some farmers welcome them as sportsmen and predator eliminators, while others see them as property destroyers and ineffective hunters. Still others realize that a reasonable number of coyotes can be helpful in controlling the number of rodents and rabbits.

In this interim phase of the program a liberal attitude appears desirable; however, all have been advised that tresspassers would be prosecuted.

VII. OTHER ITEMS

A. Items of Interest:

Perhaps the most important items concern the acquisition program. Many people are interested in progress of the project, and questions related to the extent of the proposed area were many. At this writing this office is not yet permitted to reveal the proposed boundaries. However, on the basis of information previously available some close estimations have been made, and people have a fair idea of the eventual location of the refuge.

Local economic conditions are rough, and many work applications have been received. Little is planned by way of immediate physical accomplishment. Authority has been granted for the recruitment of a Clerk-Typist, though finding the right person is more difficult than would be supposed.

When the refuge manager was assigned to the refuge August 15, there was still some question in the minds of some land owners as to whether or not the project was here to stay. Later, as the acquisition program progressed and refuge lands were posted, the skeptics became fewer.

Hunting clubs still remain the main opponents and holdouts as far as acquisition is concerned. Most of the members are converted to the principle of refuges and feel that the loss of their lands is inevitable, yet they are inclined to exercise their right to resist.

Considerably in advance of his promotion and transfer from the Salt Plains Refuge the refuge manager made several detail trips to Quivira to arrange permits, assemble data and make public contacts. During the period between assignment (August 15) and the opening of an office (Sept. 1) administrative details were attended to at the

manager's "private" office. Office furniture and equipment were acquired on a progressive basis, and some of it is still on order. For current activities the supplies and equipment are quite adequate. The setting up of office procedure expedited the completion of details and the handling of "fodder" acumulated from the time of establishment to active administration.

Considerable interest centers around plans for the disposition of buildings located on tracts under title. A listing has been made, and early authority to distribute bids is being requested.

****

B. Photographs:

In addition to the photos enclosed herewith a number of slides were made.

****

Respectfully submitted,

John B. Van den Akker

John B. Van den Akker
Refuge Manager

January 9, 1957

John L. Gallen
Regional Director 1/21/57

TABULATION OF PUBLIC USE

Refuge: Quivira National Wildlife Refuge (lands under title)

	Visitor Days This Period	Visitor Days To Date C.Y.
Hunting Use:	-	40
Fishing Use:	-	100
Miscellaneous	250	300
Estimated total use, all types	250	440

U.S. FISH & WILDLIFE SERVICE
REGIONAL OFFICE
JAN 22 1957
RECEIVED
ALBUQUERQUE, NEW MEXICO

TABULATION OF PUBLIC USE

Quivira National Wildlife Refuge (including proposed acquisition)

	Visitor Days This Period	Visitor Days To Date C.Y.
Hunting Use (Where Permitted)	250	290
Fishing Use	---	100
Miscellaneous	300	350
Estimated total use, all types	550	740

3 -1750a
Cont. NR-1
(Rev. March 1953)

WATERFOWL
(Continuation Sheet)

REFUGE QUIVIRA MONTHS OF Sept. TO Dec., 19 56

(1) Species	(2) Weeks of reporting period 11	12	13	14	15	16	17	18	(3) Estimated waterfowl days use	(4) Production Broods seen	(4) Production Estimated total
Swans:											
Whistling											
Trumpeter											
Geese:											
Canada	60	70	250	50	10	100	300		8568		
Cackling											
Brant											
White-fronted		10							70		
Snow											
Blue											
Other											
Ducks:											
Mallard	30	120	200	30	50	10	100	100	5530	1	20
Black											
Gadwall	50	150	350	50	10	10	10	10	7070		
Baldpate	20	50	200	10	10				3010		
Pintail	150	160	50	30	50	50	50	50	6650		
Green-winged teal	30	20	50	20		30			1680		
Blue-winged teal	100	120	100	30	10	10	10		5530		
Cinnamon teal											
Shoveler	50	250	80	20	10	10	10	10	6790		
Wood											
Redhead	10	40	20	10			10	10	1470		
Ring-necked											
Canvasback			10	10			10		350		
Scaup	10	20	40	10		10		10	910		
Goldeneye	XX	2							84		
Bufflehead	X	2							84		
Ruddy		10							140		
Other											
Coot:	20	20	20	10					1890		

(over)

	(5) Total Days Use	(6) Peak Number	(7) Total Production
Swans	-		
Geese	8683	300	
Ducks	39,298	1,100	20
Coots	1,890	60	-

SUMMARY

Principal feeding areas ponds and adjacent fields

Principal nesting areas marshes

Reported by J. B. Van den Akker

INSTRUCTIONS (See Secs. 7531 through 7534, Wildlife Refuges Field Manual)

(1) Species: In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance.

(2) Weeks of Reporting Period: Estimated average refuge populations.

(3) Estimated Waterfowl Days Use: Average weekly populations x number of days present for each species.

(4) Production: Estimated number of young produced based on observations and actual counts on representative breeding areas. Brood counts should be made on two or more areas aggregating 10% of the breeding habitat. Estimates having no basis in fact should be omitted.

(5) Total Days Use: A summary of data recorded under (3).

(6) Peak Number: Maximum number of waterfowl present on refuge during any census of reporting period.

(7) Total Production: A summary of data recorded under (4).

Interior Duplicating Section, Washington, D. C. 37944
1953

3-1750
Form NR-1
(Rev. March 1953)

WATERFOWL

REFUGE QUIVIRA MONTHS OF Sept. TO Dec., 19 56

(1) Species	(2) Weeks of reporting period: 1	2	3	4	5	6	7	8	9	10
Swans:										
Whistling										
Trumpeter										
Geese:										
Canada				12	12	30	80	50	150	50
Cackling										
Brant										
White-fronted										
Snow										
Blue										
Other										
Ducks:										
Mallard		10	10	10	20	10	10	10	40	30
Black										
Gadwall	10	20	30	10	10	40	60	60	90	40
Baldpate		10	10	10	10	10	20	10	20	40
Pintail		10	20	20	10	30	30	40	120	100
Green-winged teal				10		10		30	30	10
Blue-winged teal	30	40	10	10	10	30	30	50	120	80
Cinnamon teal										
Shoveler	30	40	40	50	40	50	50	60	100	70
Wood										
Redhead							10	10	40	50
Ring-necked										
Canvasback									10	10
Scaup									30	
Goldeneye									10	10
Bufflehead									10	
Ruddy									10	
Other										
Coot:				40	10	10	60	60	10	10

Int. Dup. Sec.,
Wash., D. C. 37944

3-1751
Form NR-1A
(Nov. 1945)

MIGRATORY BIRDS
(other than waterfowl)

Refuge QUIVIRA Months of ..... to Dec. 31 1946

(1) Species	(2) First Seen		(3) Peak Numbers		(4) Last Seen		(5) Production			(6) Total
Common Name	Number	Date	Number	Date	Number	Date	Number Colonies	Total # Nests	Total Young	Estimated Number
I. Water and Marsh Birds:										
Pied-billed Grebe	1	8/16	3	9/25	1	10/15				10
White Pelican			30	10/13	2	11/6				50
Double-crested Cormorant	5	9/25	5	9/25	1	10/15				15
Great Blue Heron			10	11/10	2	12/28				20
Common Egret			14	10/7	2	12/1				20
Snowy Egret			2	10/7						10
Black-cr N. Heron			30	8/1	1	11/21				50
II. Shorebirds, Gulls and Terns:										
Sandhill Crane	12	10/7	50	10/13	1	11/10				100
Sora	1	9/15								6
Killdeer			35	8/1	present					100
Common Snipe	present									10
Spotted Sandpiper	"		10	9/1						10
Willet	1	10/7	only obsv.							10
Greater Yellowlegs	12	9/25	15	10/7	6	10/30				30
Lesser Yellowlegs	15	9/25	40	10/7	1	10/30				50
Baird's Sandpiper	70	10/7			16	10/15				100
Least Sandpiper	12	9/25	30	10/7	24	10/15				15
Long-billed Dowitcher	500	10/13			30	11/6				600
Marbled Godwit	1	10/13	only obsv.							10
American Avocet	present		15	10/7	1	10/31				30
Wilson's Phalarope	30	10/31			10	11/10				100
Ring-billed Gull	100	present 9/25	500	11/6	200	present 11/21				500
Franklin's Gull		present	12,000	(10/24)						15,000
Sms-Least. Black. -										

(1)	(2)		(3)		(4)	(5)	(6)
III. Doves and Pigeons:							
Mourning dove	present		600	9/11	present		1,000
White-winged dove							
IV. Predaceous Birds:							
Golden eagle	1	11/6	2	12/7	present		6
Duck hawk	1	9/25	2	11/6	"		4
Horned owl	present		6		"		8
Magpie							
Raven							
Crow	"		10,000	11/6	"		10,000
Bald Eagle	1	11/21	4	12/3	"		4
Sharp-shinned Hawk			10	12/7	"		12
Cooper's Hawk	2	11/6	6	11/20	"		6
Red-tailed Hawk	present		16	12/7	"		20
Swainson's Hawk	"		10	12/7	"		10
Rough-legged Hawk			2	12/7	"		2
Marsh Hawk	"		10	12/7	"		12
Osprey	1	11/6	only obsv.				2
Sparrow Hawk	1	11/6	20	12/20	"		30

Reported by..... John B. Van den Akker, Ref. Mgr.

INSTRUCTIONS

(1) Species: Use the correct names as found in the A.O.U. Checklist, 1931 Edition, and list group in A.O.U. order. Avoid general terms as "seagull", "tern", etc. In addition to the birds listed on form, other species occurring on refuge during the reporting period should be added in appropriate spaces. Special attention should be given to those species of local and national significance. Groups: I. Water and Marsh Birds (Gaviiformes to Ciconiiformes and Gruiiformes)
II. Shorebirds, Gulls and Terns (Charadriiformes)
III. Doves and Pigeons (Columbiformes)
IV. Predaceous Birds (Falconiformes, Strigiformes and predaceous Passeriformes)

(2) First Seen: The first refuge record for the species for the season concerned.

(3) Peak Numbers: The greatest number of the species present in a limited interval of time.

(4) Last Seen: The last refuge record for the species during the season concerned.

(5) Production: Estimated number of young produced based on observations and actual counts.

(6) Total: Estimated total number of the species using the refuge during the period concerned.

INT.-DUP. SEC., WASH., D.C.

3-1752
Form NR-2
(April 1946)

UPLAND GAME BIRDS

1613

Refuge QUIVIRA Months of _____ to Dec. 31, 1956

(1) Species	(2) Density		(3) Young Produced		(4) Sex Ratio	(5) Removals			(6) Total	(7) Remarks
Common Name	Cover types, total acreage of habitat	Acres per Bird	Number broods obs'v'd.	Estimated Total	Percentage	Hunting	For Re-stocking	For Research	Estimated number using Refuge	Pertinent information not specifically requested. List introductions here.
Pheasant	low rangeland, sand hills, native grasses, plum brush, windbreaks, croplands	24	13	600	no apparent difference	-	-	-	800	-observations made incidental to other work and without benefit of pattern or sample plots. Number lower than normal due to extreme drought. Total acquisition area included. Due to closure of adjacent counties hunting pressure greater than normal. Predation not excessive. Under Service mgt. upland game bird pop. should benefit greatly. As the program progesses, nesting and sample plots are planned. Restocking unnecessary, and future removal through hunting a possibility.
Bobwhite quail	* lowlands not normally included in habitat; however, fencerows, tall grass and weeds provide considerable habitat. Actual habitat much less than total refuge acreage	40	3	450	*				500	

INSTRUCTIONS

Form NR-2 - UPLAND GAME BIRDS.*

(1) SPECIES: Use correct common name.

(2) DENSITY: Applies particularly to those species considered in removal programs (public hunts, etc.). Detailed data may be omitted for species occurring in limited numbers. Density to be expressed in acres per animal by cover types. This information is to be prefaced by a statement from the refuge manager as to the number of acres in each cover type found on the refuge; once submitted, this information need not be repeated except as significant changes occur in the area of cover types. Cover types should be detailed enough to furnish the desired information but not so much as to obscure the general picture. Examples: spruce swamp, upland hardwoods, reverting agriculture land, bottomland hardwoods, short grass prairie, etc. Standard type symbols listed in Wildlife Management Series No. 7 should be used where possible. Figures submitted should be based on actual observations and counts on representative sample areas. Survey method used and size of sample area or areas should be indicated under Remarks.

(3) YOUNG PRODUCED: Estimated number of young produced, based upon observations and actual counts in representative breeding habitat.

(4) SEX RATIO: This column applies primarily to wild turkey, pheasants, etc. Include data on other species if available.

(5) REMOVALS: Indicate total number in each category removed during the report period.

(6) TOTAL: Estimated total number using the refuge during the report period. This may include resident birds plus those migrating into the refuge during certain seasons.

(7) REMARKS: Indicate method used to determine population and area covered in survey. Also include other pertinent information not specifically requested.

* Only columns applicable to the period covered should be used.

3-1756
Form NR-6
(April 1946)

FISH

Refuge QUIVIRA NWR Year 1956

Species	Relative Abundance	Sport Fishing		Commercial Fishing		Restocking		Number removed for Restocking
		Man days Fishing	Number Taken	No. of Permits	Pounds Taken	Number Stocked	Area Stocked	

Due to drought all water bodies of the proposed refuge area have dried and no fish remained alive (see pics). However, upstream sources of reinfestation are expected to recreate the former unsatisfactory abundance of rough fish. Interest in a possible public fishing program is high.

The Little Salt Marsh receives the major share of popularity with the local fishing public. As development progresses additional possibilities would be created. Channel Catfish and Bullheads are the most important sport fishes of the area. Carp are not entirely without favor.

REMARKS:

81955

3-1757
Form NR-7
(April 1946)

PLANTINGS
(Marsh - Aquatic - Upland)

Refuge QUIVIRA NWR Year 1956

Species	Location of Area Planted	Rate of Seeding or Planting	Amount Planted (Acres or Yards of Shoreline)	Amount & Nature of Propagules	Date of Planting	Survival	Cause of Loss	Remarks
Sand Lovegrass	Tract 85	2 lbs./ac.	15 ac.	seed (30 lbs.)	May 3	poor	grasshoppers	
Sweet Clover	" 82	5 lbs./ac	30 ac.	seed (150 lbs)	May 4	none	"	
"	" 83	"	70 ac.	seed (350 lbs)	May 4	"	"	

Remarks: The above plantings were made in an effort to retard severe wind erosion conditions existing at the time. Germination was excellent and a particularly good stand remained until the plants reached around 3 to 4 inches. Then the grasshoppers took over, and not a plant of the succulent new growth was left. Subsequent weed growth reduced the wind hazard, and the lands noted are in fallow and well covered. The work was accomplished by custom operators.

TOTAL ACREAGE PLANTED:

Marsh and aquatic.....
Hedgerows, cover patches...115 acres food and cover
Food strips, food patches.....
Forest plantings.....

3-1758
Form NR-8
(April 1946)

CULTIVATED CROPS

Refuge QUIVIRA NWR Year 1956

Permittee (If farmed by refuge personnel, so indicate)	Permit No.	Unit or Location	Crops Grown	Avg. Yield per Acre	Permittee's Share		Government's Share or Return				
							Harvested		Unharvested		Compensatory Services, or Cash Revenue
					Acres	Bu. Harvested	Acres	Bu.	Acres	Bu.	
C. B. Wheeler	25244	Tract 82	wheat	not yet harvested, cash rent @ $4.00 per acre						(30)	$120.00
Everett C. Smith	25245	Tract 16	wheat	"			"			(108)	$432.00

Summary of Crops Grown: Crop wheat Acreage 138

Permittee's Share		Government's Share				Total Revenue
		Harvested		Unharvested		
Acres	Bushels	Acres	Bu.	Acres	Bu.	$ * 552.00

*Crops not yet harvested, land rented at rate of $4.00 per acre pending active administration. Sub-subsequent agreements planned for share-cropping.

Interior Duplicating Section, Wash.D.C.

Interior—Duplicating Section, Washington, D. C. 84268

DIRECTIONS FOR PREPARING FORM NR-8
CULTIVATED CROPS

Cultivated Crops Report Form NR-8 should be prepared on a calendar-year basis for all crops harvested or utilized during the calendar year and submitted with the December 31 refuge report.

Permittee - List each permittee separately. If lands of the refuge are farmed by refuge personnel or hired labor, this should be indicated in the Permittee column.

Permit No. - List the number of the Special Use Permit issued to the individual.

Use or location - The Unit No. or name specified in the Economic Use Plan should be listed in this column.

Crops Grown - A separate line of the form should be used for each crop grown by each permittee or by refuge personnel. This is important, since if each crop grown by each operator is not specifically enumerated, the report will be of no value for statistical purposes.

Average Yield per Acre - It is important that the average yield per acre of each crop grown by each operator should be shown.

Permittee's Share - Only the number of acres harvested or utilized by the permittee for his own benefit should be shown under the Acres column, and only the number of bushels of farm crops harvested by the permittee for himself should be shown under the Bushels Harvested column. It is requested that all crops harvested be reduced to bushels wherever possible, or, as in the case with the harvesting of seed such as that of sweet clover, alfalfa, bromegrass, etc., the total harvested crop in pounds may be shown. Timothy, alfalfa, or other hay harvested by the permittee should be shown on Form NR-10 and should not be shown in the Permittee's Share column.

Government's Share or Return - Harvested - Show the number of bushels harvested for the Government and the acreage from which this share is harvested, both for grain raised by refuge personnel and by permittees. Unharvested - show the exact number of acres of crops allowed to remain unharvested as food and cover for wildlife. An estimate of the number of bushels of grain that is available for the wildlife in such unharvested crops should be shown in the Bushels column.

Compensatory Services, or Cash Revenue - Show other services received by the Government in cooperative farming activities, the number of acres of food strips planted for wildlife, the amount of wildlife crops not otherwise reported that are planted by cooperators for the Service, or the cultivation of wildlife plantations. If the permit is on a fee basis, the total cash revenue received by the Service.

3-1760
Form NR-10
(April 1946)

HAYING AND GRAZING

Refuge QUIVIRA NWR Year 19 56

Permittee	Permit No.	Unit or Location	Actual Acreage Utilized	Animal Use Months	Tons of Hay Harvested	Period of Use From - To	Rate	Total Income	Remarks
Thomas E. Dugan	25242	Tract 14	150	102		7/1 - 9/30	$2.00	$204.00	
Thomas E. Dugan	25243	Tract 14	5		8,215 lbs.	7/30/8/3	$6.50 (ton)	26.70	Alfalfa hay sold standing
Thomas E. Dugan	25246	Tract 14	5		6,500 lbs.	8/15:8/30	"	21.13	"
C. B. Wheeler	*	Tract 82	10		3,568 tons	6/13/56	"	23.19	"
Everett C. Smith	*	Tract 16	6		4,370 lbs.	6/13/56	"	14.20	"

* permits issued from Salt Plains and not available at this time

-limited production of hay due to drought and insect damage

Totals:

Acreage grazed 150 Animal use months 102 Total income Grazing $204

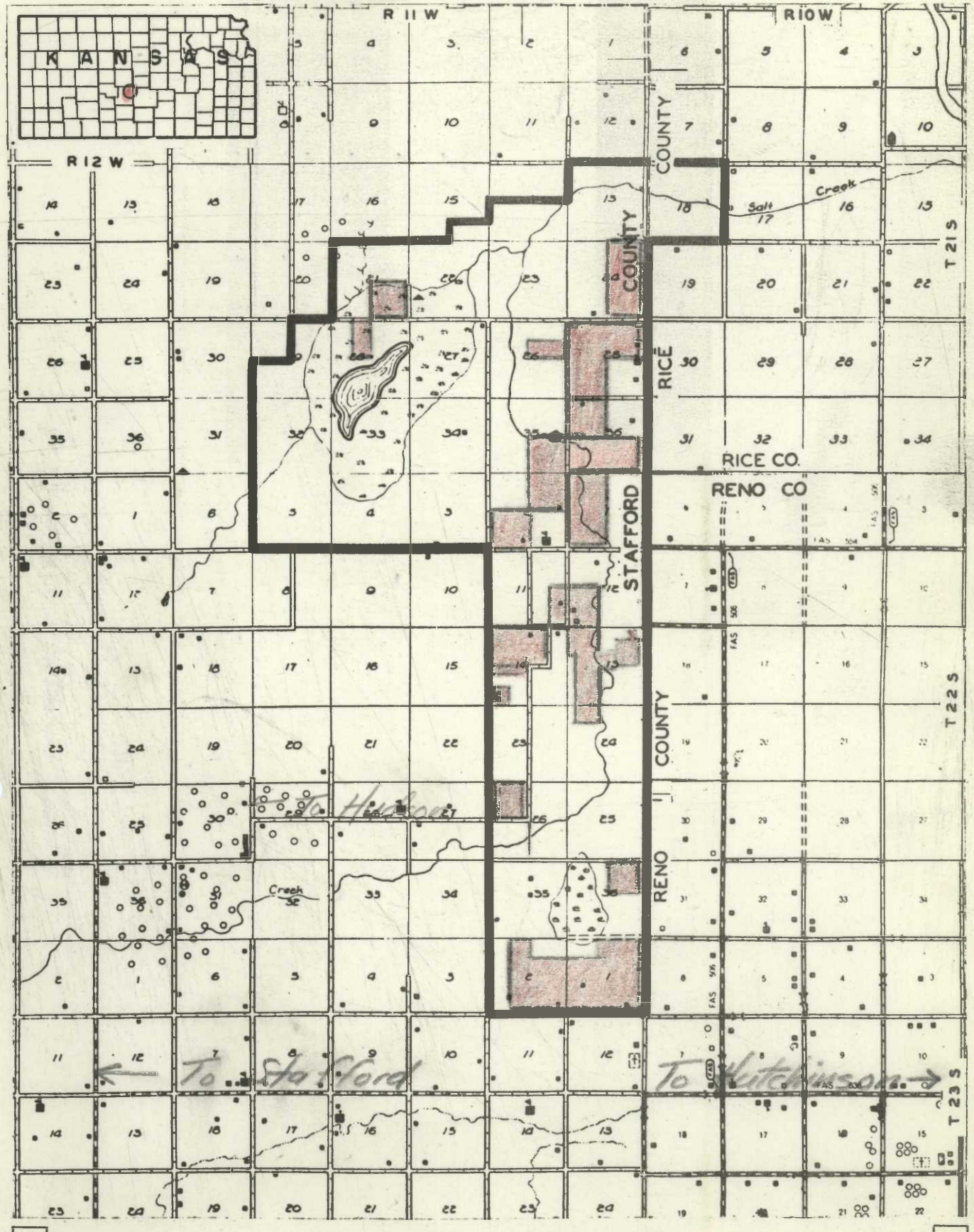
Acreage cut for hay 26 Tons of hay cut 13.11 Total income Haying $85.22

INT.-DUP. SEC., WASH., D.C. 59314

Lands under title or agreement as of Jan. 1, 1957 (approx. 4,000 acres)
Tentative total planned for acquisition 21,513 acres

QUIVIRA NATIONAL WILDLIFE REFUGE

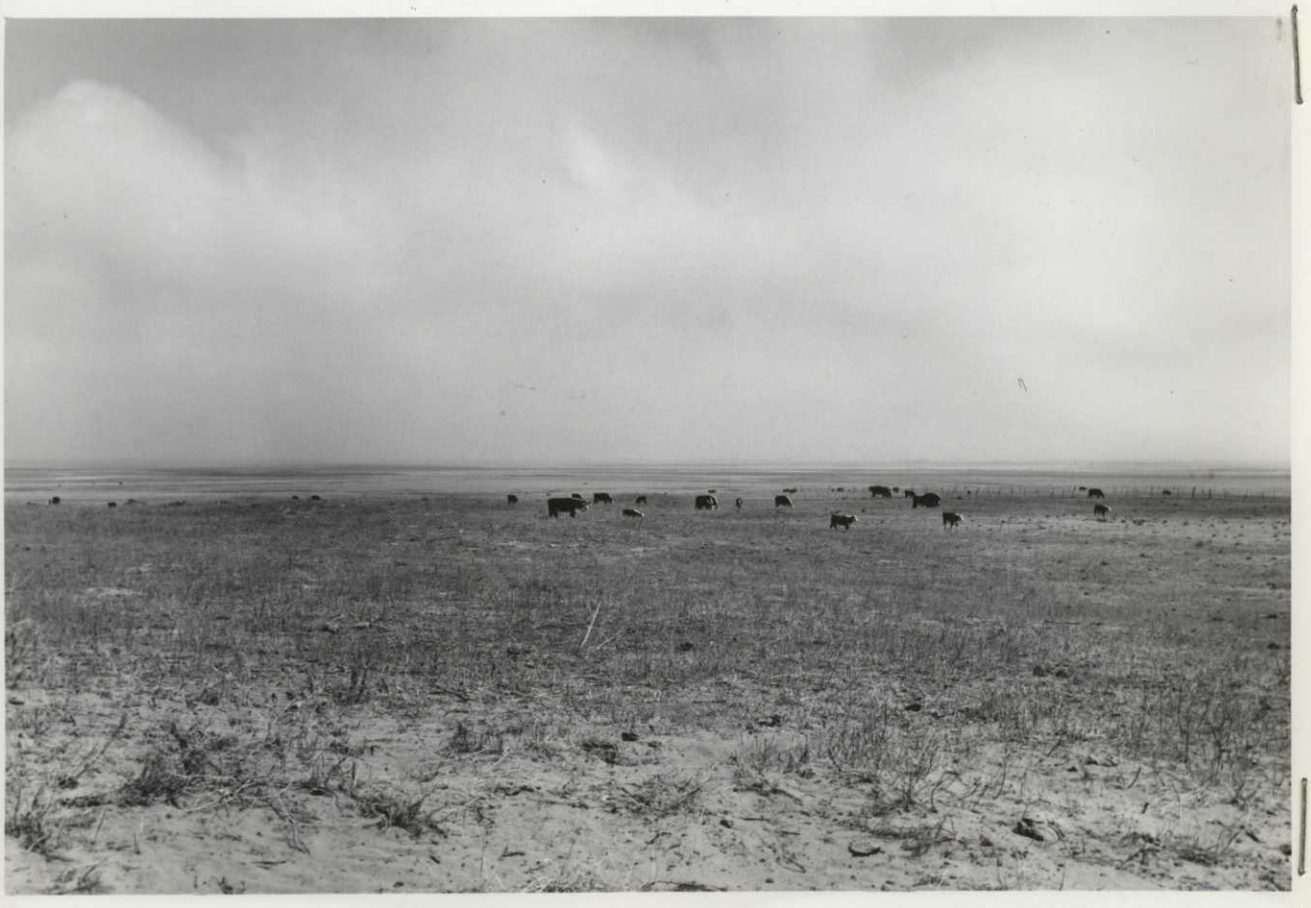
Rice & Stafford Counties, Kansas



#6-B Big Salt Marsh April 9, 1955 by Rex G. Schmidt
#16-B Little Salt Marsh and club Sec.36,T.22S.,R.11W. Rex G. Schmidt

#25 Hunt club pond S½ Sec. 28, T.21S.,R.11W. from NE 4/9/55 Schmidt

#23 Typical grassland Sec. 5, T.22S., R.11W 4/9/55 Rex G. Schmidt



Facing west across club properties and south end Little Salt Marsh. August 1956

Looking NE across Artesia Club toward Little Salt Marsh. August, 1956

High Stocking Rates and Drought extract a toll

September, 1956

Saltgrass and Salt Cedar border dry Salt Flats
(flats normally flood in cooler seasons and rain)
September, 1956

Looking SSW over dry lakebed of Little Salt Marsh 8/31/56

Water well and pump used to flood shooting area in NW¼ Sec.32, T.21S.,R.11W., looking ESE. 4/9/55 Rex G. Schmidt
(pumping for hunting was repeated on more extensive scale in '56)

Sign, typical of many forbidding trespass on club property

Fish killed when Little Salt Marsh dried. Note super-abundance of small fish and relative scarcity of large fish. September, 1956

County road paralleling south boundary of refuge--sometimes blows full. July, 1956

Typical sand dunes on refuge. August, 1956